U.S. Army Corps of Engineers
Project : Remedial Suite No. 2

Green River LD 3

30% Design Cost Estimate

Green River

Lock and Dam 3

Rochester, Kentucky

Estimated by Erin Mattmiller, EIT April Welshans, EIT
Designed by April Welshans, EIT Jeffrey Dingrando, PE
Prepared by Erin Mattmiller, EIT Tom Pace, PE
Preparation Date 5/9/2011
Effective Date of Pricing 3/1/2016
Estimated Construction Time 260 Days

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Design Document 30% Design Document
Document Date 5/9/2011

District Louisville
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Budget Year 2011
UOM System Original

Direct Costs
LaborCost
EQCost
MatlCost
SubBidCost

Timeline/Currency
Preparation Date 5/9/2011
Escalation Date 3/1/2016
Eff. Pricing Date 3/1/2016
Estimated Duration 260 Day(s)

Currency US dollars
Exchange Rate 1.000000

Costbook CB10EB: MII English Cost Book 2010

Labor KY100192: General Decision Number: KY100192 10/15/2010 KY192
Note: http://www.wdol.gov General Decision Number: KY100192 04/01/2011 KY192 State: Kentucky
Construction Type: Heavy Including Water and Sewer Line Construction. Counties: Ballard, Caldwell, Calloway, Carlisle, Crittenden, Fulton, Graves, Hickman, Hopkins, Livingston, Lyon, Marshall, McCracken, Muhlenberg, Ohio, Todd and Union Counties in Kentucky.

Labor Rates
LaborCost1
LaborCost2
LaborCost3
LaborCost4

Equipment EP09R02: MII Equipment Region 2 2009

02 MIDEAST

Sales Tax	6.00
Working Hours per Year	1,450
Labor Adjustment Factor	1.02
Cost of Money	4.88
Cost of Money Discount	25.00
Tire Recap Cost Factor	1.50
Tire Recap Wear Factor	1.80
Tire Repair Factor	0.15
Equipment Cost Factor	1.00
Standby Depreciation Factor	0.50

Fuel

Electricity	0.094
Gas	2.960
Diesel Off-Road	3.040
Diesel On-Road	3.590

Shipping Rates

Over 0 CWT	9.19
Over 240 CWT	8.46
Over 300 CWT	7.61
Over 400 CWT	6.83
Over 500 CWT	4.13
Over 700 CWT	4.13
Over 800 CWT	6.14

Currency in US dollars

Date	Author	Note

3/23/2011 Erin Mattmiller

SUMMARY OF SCOPE OF WORK
This estimate outlines the costs (estimated at the 30% design phase) for repair of the dam and construction of a concrete bulkhead wall at the lock. To create a uniform crest elevation, sheet piles will be driven to rock upstream of the existing rock-filled timber crib dam and a reinforced concrete cap will be constructed on the upstream sloping portion of the existing dam. The top elevation of the sheet piling and the concrete cap will be equal to the crest of the existing dam. Derrick stone on the face of the rock-filled timber crib dam will be replenished back to the approximate grade at which it was installed. The new derrick stone will be slush grouted in place. A reinforced concrete bulkhead wall and splash pad will be constructed on the upper sill and keyed into the lock walls. The upper and lower gates will be pinned back into their recesses to deter pedestrians from accessing the lock chamber and to limit accumulation of sediment in the chamber.

EFFECTIVE DATE OF PRICING AND ESCALATION:
In order to compare costs between suites, the effective date of pricing for all three suites, including Suite 2, is 3/1/2016 which corresponds to the midpoint of construction for Suite 3. All project items were escalated from 1/1/2010 to 3/1/2016. Items obtained from sources other than the 2010 Cost Book were first escalated to 1/1/2010 then escalated to 3/1/2016 with the 2010 Cost Book items.

JOB OFFICE OVERHEAD (JOOH)
The JOOH markups for the Prime Contractor and Subcontractor were calculated as running percentages of 6% and 10%, respectively per the direction from James J. Vermillion, CCC, Cost Engineer, USACE Louisville District, based on his experience with similar projects at the 30% design level. The markups can be adjusted if needed at later design levels and also if the contract acquisition is known for sure. A JOOH Direct Cost Report is provided to document the anticipated overhead items necessary to complete the project; however, the costs reported on the JOOH Direct Cost Report are not a part of the Contract or Project Cost.

ASSUMPTIONS:
1. The contractor can perform the work in one, 8-month construction season dating from May 2015 through December 2015.

2. The MATOC structure for contracting was used to build this estimate where the Prime Contractor administers the construction contract and the Sub Contractor performs all of the contruction work.

3. Contingency and SIOH are calculated as flat rates of 25% and 8%,respectively across the total project per the direction of James J. Vermillion, CCC, Cost Engineer, USACE Louisville District.

4. Kentucky State Sales Tax is applied to all material costs and rental costs for the USR equipment items consisting of the material transport barge, work barge, and 150-ton crawler crane. These items were not listed in the 2010 Cost Book so rental rates were obtained from the 2006 and 2008 RS Means Cost Data and escalated first to 2010, then to 2016 with the 2010 Cost Book items.

5. Labor rates were obtained from http://www.wdol.gov General Decision Number: KY100192 04/01/2011 KY192 State: Kentucky Construction Type: Heavy Including Water and Sewer Line Construction Counties: Ballard, Caldwell, Calloway, Carlisle, Crittenden, Fulton, Graves, Hickman, Hopkins, Livingston, Lyon, Marshall, McCracken, Muhlenberg, Ohio, Todd and Union Counties in Kentucky.

6. Costs for Planning, Engineering, and Design were calculated as 8% of the total Project Direct Cost for all items except for Planning, Engineering, and Design per the direction of James J. Vermillion, CCC, Cost Engineer, USACE Louisville District.

Labor ID: KY100192 EQ ID: EP09R02 Currency in US dollars TRACES MII Version 4.1

Date Author **Note**

7. No acquisition of real estate is necessary for the project since all of the project area is owned by the United States of America.

8. Traffic control is minimal and the project area is closed to the public (no traffic).

9. All river and lock excavation will be accomplished by dredging with a barge-mounted crane and clamshell bucket.

10. The following bulking factors are used for estimating disposal volumes:

-Bulking for demolished concrete and excavated rock 1.50
-Bulking for demolished steel 2.00
-Bulking for excavated soils 1.30

11. The haul distance to the disposal site for all disposal materials is assumed as 15 miles round trip.

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Direct Cost Markups	**Category**	**Method**
Productivity	Productivity	Productivity
Overtime	Overtime	Overtime

	Days/Week	*Hours/Shift*	*Shifts/Day*	*1st Shift*	*2nd Shift*	*3rd Shift*
Standard	*5.00*	*10.00*	*1.00*	*8.00*	*0.00*	*0.00*
Actual	*5.00*	*10.00*	*1.00*	*8.00*	*0.00*	*0.00*

Day	*OT Factor*	*Working*	*OT Percent*	*FCCM Percent*
Monday	*2.00*	*Yes*	*25.00*	*0.00*
Tuesday	*2.00*	*Yes*		
Wednesday	*2.00*	*Yes*		
Thursday	*2.00*	*Yes*		
Friday	*2.00*	*Yes*		
Saturday	*2.00*	*No*		
Sunday	*2.00*	*No*		

Sales Tax	TaxAdj	Running % on Selected Costs
MatlCost		

Contractor Markups	**Category**	**Method**
Prime JOOH	JOOH	Running %
Sub JOOH	JOOH	Running %
HOOH	HOOH	Running %
Prime Profit	Profit	Profit Weighted Guidelines

Guideline	*Value*	*Weight*	*Percentage*
Risk	*0.040*	*20*	*0.80*
Difficulty	*0.040*	*15*	*0.60*
Size	*0.030*	*15*	*0.45*
Period	*0.030*	*15*	*0.45*
Invest (Contractor's)	*0.030*	*5*	*0.15*
Assist (Assistance by)	*0.030*	*5*	*0.15*
SubContracting	*0.120*	*25*	*3.00*
Total		*100*	*5.60*

Sub Profit	Profit	Profit Weighted Guidelines

Guideline	*Value*	*Weight*	*Percentage*
Risk	*0.100*	*20*	*2.00*
Difficulty	*0.100*	*15*	*1.50*
Size	*0.030*	*15*	*0.45*
Period	*0.120*	*15*	*1.80*
Invest (Contractor's)	*0.080*	*5*	*0.40*
Assist (Assistance by)	*0.110*	*5*	*0.55*
SubContracting	*0.030*	*25*	*0.75*
Total		*100*	*7.45*

Bond	Bond	Running %
Excise Tax	Excise	Running %

Owner Markups	**Category**	**Method**
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Currency in US dollars

Escalation	Escalation	Escalation
StartDate	*StartIndex*	*EndDate*
1/1/2010	*720.27*	*3/1/2016*

Escalation	Escalation
EndIndex	*Escalation*
791.90	*9.94*

Contingency	Contingency	Running %
SIOH	SIOH	Running %

Description	Quantity	UOM	ContractCost	Escalation	Contingency	SIOH	ProjectCost
Project Cost Summary Report			**2,171,478**	**215,845**	**596,831**	**238,732**	**3,222,886**
			1,690,456.35				*2,508,958.41*
Dams	**1.00**	**EA**	**1,690,456**	**168,031**	**464,622**	**185,849**	**2,508,958**
			1,690,456.35				*2,508,958.41*
Main Dam	**1.00**	**EA**	**1,690,456**	**168,031**	**464,622**	**185,849**	**2,508,958**
			3,714.01				*5,512.30*
Site Restoration	**1.00**	**EA**	**3,714**	**369**	**1,021**	**408**	**5,512**
			0.22	*9.94%*	*27.48%*	*10.99%*	*0.32*
Fine grading, slopes, gentle, finish grading (Note: This item covers grading for an area equal to the clearing and grubbing area.)	1,000.00	SY	218	22	60	24	324
			0.70	*9.94%*	*27.49%*	*10.99%*	*1.03*
Seeding, mechanical seeding hydro or air seeding for large areas, includes lime, fertilizer and seed (Note: This item covers seeding for an area equal to the clearing and grubbing area.)	1,000.00	SY	696	69	191	77	1,033
			2,799.95				*4,155.65*
Restore Portion of County Road 1273 as Gravel Road (Note: This item covers restoration for a 140-foot-long and 15-foot-wide section of County Road 1273.)	**1.00**	**EA**	**2,800**	**278**	**770**	**308**	**4,156**
			11.67	*9.94%*	*27.48%*	*10.99%*	*17.32*
Temporary, roads, gravel fill, 4" gravel depth, excl surfacing	240.00	SY	2,800	278	770	308	4,156
			34,913.69				*51,818.55*
Bracing (Note: Bracing is based on that used at KY River L&D3. The bracing consisted of heavy steel sections. The sections used here are similar, although some adjustments have been made to avoid using sections not found in the UPB. The quantities for each section used have been adapted for the geometry of the cells at Green River L&D3)	**1.00**	**EA**	**34,914**	**3,470**	**9,596**	**3,838**	**51,819**
			232.76	*9.94%*	*27.49%*	*10.99%*	*345.46*
Structural steel member, 100-ton project, 1 to 2 story building, W24x117, A992 steel, shop fabricated, incl shop primer, bolted connections	150.00	LF	34,914	3,470	9,596	3,838	51,819
			91,033.11				*135,110.43*
Tremie Concrete	**1.00**	**EA**	**91,033**	**9,049**	**25,020**	**10,008**	**135,110**
			189.65	*9.94%*	*27.48%*	*10.99%*	*281.48*
Structural concrete, ready mix, normal weight, 2000 psi, includes local aggregate, sand, Portland cement and water, delivered, excludes all additives and treatments	480.00	CY	91,033	9,049	25,020	10,008	135,110
(Note: This item covers concrete for slush grouting the derrick stone and the timber frame repairs. This USR CSI Task for tremie concrete was built by copying the the 03 31 05 35 0200 CSI Task from the Cost Book which provided only material costs and adding the Tremie Concrete Crew for labor and equipment costs.Add $1.05 per CY for Environmental and Energy Charges and $14.00 per cubic yard for anti wash out treatment per direction from a quote from imi, a local concrete vendor. So total material price/CY is $106.55/CY. Production rate is 100 CY/Hour Based on experience at KY River L&D3 cell dam. The equipment for the crew for this task consists of 1 concrete pump, 2 cranes, 2 barges, 1 tug boat, and 1 front-end loader. The laborers for this crew consist of 5 semi-skilled laborers, 1 oiler, 1 medium equipment operator for the tug boat, 1 foreman, and 2 heavy equipment operators for the cranes. The volume of concrete for slush grouting (120 CY) was calculated by multiplying the plan area of derrick stone placement and slush grouting by an assumed depth. The assumed depth for slush grouting was calculated by assuming that the slush grouting will extend to half of the depth of the derrick stone (10 feet); therefore, the assumed depth of slush grouting was calculated as 5 feet. The volume of concrete for repairs to the timber frame (360 CY) was calculated by determining the timber crib surface area (beneath the reinforced concrete cap) and multiplying the area by an assumed placement depth of 2 feet.)								
			28,610.02				*42,462.71*
Dewatering	**1.00**	**EA**	**28,610**	**2,844**	**7,863**	**3,145**	**42,463**
			1,144.40	*9.94%*	*27.48%*	*10.99%*	*1,698.51*

Currency in US dollars

Description	Quantity	UOM	ContractCost	Escalation	Contingency	SIOH	ProjectCost
Dewatering, pumping, 8 hr., attended 8 hours per day, 3" centrifugal pump, includes 20 L.F. of suction hose and 100 L.F. of discharge hose	25.00	DAY	28,610	2,844	7,863	3,145	42,463
			52,081.04				*77,298.16*
Derrick Stone	**1.00**	**EA**	**52,081**	**5,177**	**14,314**	**5,726**	**77,298**
			89.75	*9.94%*	*27.49%*	*10.99%*	*133.20*
Derrick Stone Placement	500.00	TON	44,873	4,460	12,333	4,933	66,600
(Note: The USR CSI Task for derrick stone was built by determining material costs, estimating a production rate, and creating a USR crew of equipment and laborers. Material cost from Greenville Quarries, Contact is John Stovall (270) 338-2300. $48/ton for derrick stone delivered by truck to site, includes unloading time for delivery and truck driver. Production rate of 100 tons/hour derived by calculating the total time for placement of 900 tons of derrick stone. The calculation of the total time to place all of the derrick stone accounted for the time to complete the following tasks: -unload the rock from the delivery truck; -load the rock onto the material transport barge; -travel time for the barge; -unload the rock from the barge; and -placement of the derrick stone. The production rate was calculated by dividing 900 tons by the total time to place 900 tons (9 hours) which equals 100 tons/hour. The quantity for derrick stone was calculated by determining the area of placement and multiplying by a depth of 10 feet to get the volume of stone in cubic yards. A unit weight of 110 lb/cubic foot that accounts for porosity was used to convert from cubic yards of stone to tons.)								
			14.42	*9.94%*	*27.48%*	*10.99%*	*21.40*
Derrick Stone Placement	500.00	TON	7,208	717	1,981	792	10,699
(Note: The USR CSI Task for derrick stone was built by estimating a production rate and creating a USR crew of equipment and laborers.There is no material cost for this item since it assumed that half of the derrick stone will be obtained from dredging and reused. Production rate of 100 tons/hour derived by calculating the total time for placement of 900 tons of derrick stone. The calculation of the total time to place all of the derrick stone accounted for the time to complete the following tasks: -unload the rock from the delivery truck; -load the rock onto the material transport barge; -travel time for the barge; -unload the rock from the barge; and -placement of the derrick stone. The production rate was calculated by dividing 900 tons by the total time to place 900 tons (9 hours) which equals 100 tons/hour. The quantity for derrick stone was calculated by determining the area of placement and multiplying by a depth of 10 feet to get the volume of stone in cubic yards. A unit weight of 110 lb/cubic foot that accounts for porosity was used to convert from cubic yards of stone to tons.)								
			125,453.88				*186,197.39*
Dredging	**1.00**	**EA**	**125,454**	**12,470**	**34,481**	**13,792**	**186,197**
			20.04	*9.94%*	*27.48%*	*10.99%*	*29.75*
Mechanical dredging, 20 miles, barge mounted clamshell excavation into scows, dumped at sea, minimum	1,900.00	BCY	38,081	3,785	10,466	4,187	56,519
(Note: The dredging volume was calculated by first asssuming that the total dredging volume is equal to the concrete cap volume plus additional dredging needed upstream of the sheet piles. The additional dredging volume was calculated by (1) dividing the dredging area into sections in plan view, (2) multiplying the plan area of each section by the average of the excavation depths at the beginning of the section and end of the section to get a volume, and (3) adding the volumes of each section to get a total dredging volume.)							
			41.61	*9.94%*	*27.49%*	*10.99%*	*61.75*
Spoil Disposal	2,100.00	LCY	87,373	8,685	24,015	9,606	129,678
(Note: Increase cost for hauling item by 1.5 since it is for a haul distance of 10 miles and the assumed haul distance for the project is 15 miles. Spoil Disposal Volume = Total Dredging Volume - 338 CY for derrick stone to be reused x 1.30 (bulking factor for excavated soils).)							
			446,407.83				*662,554.04*
Sheet Piling	**1.00**	**EA**	**446,408**	**44,373**	**122,695**	**49,078**	**662,554**
			54.07	*9.94%*	*27.48%*	*10.99%*	*80.25*
PZ22 Sheet Piling	7,875.00	SF	425,788	42,323	117,028	46,811	631,950
(Note: The USR CSI Task for sheet piling was built by determining material costs, estimating a production rate, and creating a USR crew of equipment and laborers. Material Quote from Skyline Steel - Alex Grainger (West Chester, OH office - 513-777-7039) = $0.83 per LB x 22 LB/SF (Skyline) = $18.26/SF delivered for PZ22 sheet piling for piles <=50 ft in length. Production rate estimated from Stantec's experience at KY River L&D3 with constructing a cell dam. Production rate was 5 days/main cell and the average square footage of piling per main cell was 3,430 SF/main cell. The equipment for the crew consists of 2 cranes, 2 barges, 1 tug boat, and 1 pile hammer. The labor for the crew for this task consists of 1 medium equipment operator that serves as the tug boat captain, 2 heavy equipment operators for the cranes, 1 equipment oiler, 2 pile drivers, and one half-time pile driver foreman. The sheet piling quantity was calculated by (1) dividing the length of the dam into sections, (2) multiplying the average of the height of the crest to the rock elevation at the beginning station and ending station by the width of the section, and (3) adding the area of sheet piling for each section for the total area of sheet piling.)								

Labor ID: KY100192 EQ ID: EP09R02 | Currency in US dollars | TRACES MII Version 4.1

Description	Quantity	UOM	ContractCost	Escalation	Contingency	SIOH	ProjectCost
			31.54	*9.94%*	*27.49%*	*10.99%*	*46.80*
Curb edging, structural steel angle w/ anchors, on concrete forms, 8.2 plf, 4" x 4", shop fabricated (Note: This item covers materials to pin the upstream sheets to the reinforcement in the concrete cap.)	230.00	LF	7,253	721	1,994	797	10,765
			29.06	*9.94%*	*27.48%*	*10.99%*	*43.13*
Welding structural steel in field, single pass, 0.4 Lb/LF, 5/16" thick, continuous fillet, type 6011 (Note: This item covers the welding of the pin reinforcement to the sheet piles.)	460.00	LF	13,367	1,329	3,674	1,470	19,839
			908,242.77				*1,348,004.83*
Reinforced Concrete (Note: The volume of reinforced concrete for the cap was calculated by multiplying the cross-sectional area of the cap in section view by the length of the dam.)	**1.00**	**EA**	**908,243**	**90,279**	**249,631**	**99,852**	**1,348,005**
			682.89	*9.94%*	*27.48%*	*10.99%*	*1,013.54*
Structural concrete, in place, free-standing wall (3000 psi), 15" thick x 18' high, includes forms(4 uses), reinforcing steel, concrete, placing and finishing (Note: This item covers the concrete for the concrete cap.)	1,330.00	CY	908,243	90,279	249,631	99,852	1,348,005
			349,520.71				*518,755.14*
Locks	**1.00**	**EA**	**349,521**	**34,742**	**96,066**	**38,426**	**518,755**
			1,798.58				*2,669.43*
Demolish Railing Parallel to Land Lock Wall	**1.00**	**EA**	**1,799**	**179**	**494**	**198**	**2,669**
			3.82	*9.94%*	*27.49%*	*10.99%*	*5.67*
Selective demolition, misc metal fences & gates, metal tubular picket fences, 4'-6' high	320.00	LF	1,223	122	336	134	1,815
			38.39	*9.94%*	*27.48%*	*10.99%*	*56.98*
Selective demolition, disposal only, urban buildings with salvage value allowed, steel frame, includes loading and 5 mile haul to dump (Note: Increase bare cost by a factor of 3.0 since a 15-mile haul to dump is assumed for the project. Disposal Volume = 2 x Volume of posts and rails to account for bulking.)	15.00	CY	576	57	158	63	855
			18,760.79				*27,844.57*
Replace Railing Parallel to Land Lock Wall	**1.00**	**EA**	**18,761**	**1,865**	**5,156**	**2,063**	**27,845**
			58.63	*9.94%*	*27.49%*	*10.99%*	*87.01*
Railing, pipe, steel, primed, 2 rails, 3'-6" high, posts @ 5' O.C., 1-1/2" dia, shop fabricated	320.00	LF	18,761	1,865	5,156	2,063	27,845
			262.05				*388.93*
Safety Signage	**1.00**	**EA**	**262**	**26**	**72**	**29**	**389**
			43.67	*9.94%*	*27.48%*	*10.99%*	*64.82*
Safety signs (yellow and magenta), aluminum/acrylic, 10" x 14"	6.00	EA	262	26	72	29	389
			177,913.51				*264,057.45*
Dredging to Open Gates	**1.00**	**EA**	**177,914**	**17,685**	**48,900**	**19,560**	**264,057**
			20.04	*9.94%*	*27.48%*	*10.99%*	*29.75*
Mechanical dredging, 20 miles, barge mounted clamshell excavation into scows, dumped at sea, minimum (Note: The dredging volume was calculated by (1) dividing the dredging area into sections in plan view, (2) multiplying the plan area of each section by the average of the excavation depths at the beginning of the section and end of the section to get a volume, and (3) adding the volumes of each section to get a total dredging volume.)	2,400.00	BCY	48,102	4,781	13,221	5,288	71,392
			41.61	*9.94%*	*27.49%*	*10.99%*	*61.75*
Spoil Disposal (Note: Increase cost for hauling item by 1.5 since it is for a haul distance of 10 miles and the assumed haul distance for the project is 15 miles. Spoil Disposal Volume = Total Dredging Volume x 1.30	3,120.00	LCY	129,812	12,903	35,679	14,271	192,665

Currency in US dollars

Description	Quantity	UOM	ContractCost	Escalation	Contingency	SIOH	ProjectCost
(bulking factor for excavated soils).)							
			27,413.96				*40,687.53*
Steel For Pinning Gates	**1.00**	**EA**	**27,414**	**2,725**	**7,535**	**3,014**	**40,688**
(Note: The tie-back consists of a W section, a thin steel plate, and an anchor rod. The W-section size was assumed to be a W8x58 section based on similar designs at Kentucky River Lock No. 5, 6, & 7. Since this size was unavailable in 2010 RS Means, the larger W12x58 was chosen. The extra material and cost of the W12x58 was assumed to account for the steel required for the steel plate and anchor rod. Due to limited design drawings, the actual geometry of the lock gates and stiffeners is unknown. Therefore, the length of the weld between the W section and the gate stiffener was assumed to be 6 linear feet per W section.)							
			119.95	*9.94%*	*27.49%*	*10.99%*	*178.02*
Structural steel member, 100-ton project, 1 to 2 story building, W12x58, A992 steel, shop fabricated, incl shop primer, bolted connections	130.00	LF	15,593	1,550	4,286	1,714	23,143
			29.06	*9.94%*	*27.49%*	*10.99%*	*43.13*
Welding structural steel in field, single pass, 0.4 Lb/LF, 5/16" thick, continuous fillet, type 6011	100.00	LF	2,906	289	799	319	4,313
			89.15	*9.94%*	*27.48%*	*10.99%*	*132.31*
Welding structural steel in field, cleaning & welding plates/bars/rods to existing beams/columns/trusses	100.00	LF	8,915	886	2,450	980	13,231
			16,477.40				*24,455.60*
Restore Concrete Esplanade	**1.00**	**EA**	**16,477**	**1,638**	**4,529**	**1,812**	**24,456**
(Note: Total area of esplanade is 867 SY. Assume 50% of esplanade will need restoration.)							
			36.62	*9.94%*	*27.48%*	*10.99%*	*54.35*
Concrete paving surface treatment, 4500 psi, fixed form, unreinforced, 12' pass, 6" thick, includes joints, finishing, and curing (Note: Total area of esplanade is 867 SY. Assume 50% of esplanade will need restoration.)	450.00	SY	16,477	1,638	4,529	1,812	24,456
			12,745.13				*18,916.20*
Concrete Sawing	**1.00**	**EA**	**12,745**	**1,267**	**3,503**	**1,401**	**18,916**
			182.07	*9.94%*	*27.49%*	*10.99%*	*270.23*
Concrete sawing, concrete walls, plain, per inch of depth, hydraulic saw (Note: Multiply original price of $4.22 per inch of depth/LF by 24 to account for 6-inch depth and 24-inch-thick bulkhead wall (assume that it takes 4 cuts to cut out 2-foot-wide and 6-inch-deep key. Quantity in LF of concrete sawing is equal to the length of the bottom of the wall (42 feet) plus the height of the wall (12.9 ft) per side x 2 sides.)	70.00	LF	12,745	1,267	3,503	1,401	18,916
			20,144.50				*29,898.27*
Temporary Bulkhead Bracing	**1.00**	**EA**	**20,145**	**2,002**	**5,537**	**2,215**	**29,898**
(Note: Bracing is based on that used at KY River L&D3. The bracing consisted of heavy steel sections. The sections used here are similar, although some adjustments have been made to avoid using sections not found in the UPB. The quantities for each section used have been adapted for the geometry of the cells at Green River L&D3.)							
			167.87	*9.94%*	*27.48%*	*10.99%*	*249.15*
Structural steel member, 100-ton project, 1 to 2 story building, W36x150, A992 steel, shop fabricated, incl shop primer, bolted connections (Note: Reduce bare cost of $186.71 by 57% to $106.42 since steel will be salvaged. The 57% discount was calculated by taking the total bare cost (labor, equipment, and materials) for salvaged PZ22 Sheet Piling from 2010 RS Means 31 41 16 10 1600 and dividing by the Stantec derived unit rate of $36.89 for PZ22 Sheet Piling (labor, equipment, and materials) that included sheet piling purchased from the manufacturer.)	120.00	LF	20,145	2,002	5,537	2,215	29,898
			32,778.69				*48,649.80*
Reinforced Concrete	**1.00**	**EA**	**32,779**	**3,258**	**9,009**	**3,604**	**48,650**
			682.89	*9.94%*	*27.48%*	*10.99%*	*1,013.54*
Structural concrete, in place, free-standing wall (3000 psi), 15" thick x 18' high, includes forms(4 uses), reinforcing steel, concrete, placing and finishing	48.00	CY	32,779	3,258	9,009	3,604	48,650

Currency in US dollars

Description	Quantity	UOM	ContractCost	Escalation	Contingency	SIOH	ProjectCost
(Note: This item covers the concrete for the bulkhead wall and splash pad. The volume of concrete is equal to the volume of the bulkhead wall (width x length x height) and the splash pad (plan area of splash pad x height).)							
			17,166.01				*25,477.63*
Dewatering	**1.00**	**EA**	**17,166**	**1,706**	**4,718**	**1,887**	**25,478**
			1,144.40	*9.94%*	*27.48%*	*10.99%*	*1,698.51*
Dewatering, pumping, 8 hr., attended 8 hours per day, 3" centrifugal pump, includes 20 L.F. of suction hose and 100 L.F. of discharge hose	15.00	DAY	17,166	1,706	4,718	1,887	25,478
(Note: The quantity for days of dewatering was calculated by estimating the total duration using the produciton rates and quantities for pinning the gates, welding, concrete cutting, installing the sheet piles, installing the bracing, and constructing the bulkhead wall and splash pad.)							
			24,060.08				*35,709.73*
Sheet Piling	**1.00**	**EA**	**24,060**	**2,392**	**6,613**	**2,645**	**35,710**
			30.08	*9.94%*	*27.48%*	*10.99%*	*44.64*
Sheet piling, steel, 27 psf, 20' excavation, drive, extract and salvage, excludes wales	800.00	SF	24,060	2,392	6,613	2,645	35,710
(Note: The area for temporary sheet piling was calculated by multiplying the height of the temporary bulkhead wall by the width of the lock chamber.)							
			131,500.94				*195,172.39*
Planning, Engineering and Design	**1.00**	**EA**	**131,501**	**13,071**	**36,143**	**14,457**	**195,172**
(Note: Costs based on 8% of Project Direct Cost per James J. Vermillion, CCC, Cost Engineer, USACE Louisville District.)							
Planning, Engineering, & Design	1.00	LS	131,501	13,071	36,143	14,457	195,172
(Note: Costs based on 8% of Project Direct Cost per James J. Vermillion, CCC, Cost Engineer, USACE Louisville District. Used 8% of $1,377,881 which corresponds to the total project direct costs for all items except for Planning, Engineering, & Design.)							

Currency in US dollars

Description	Quantity	UOM	Contractor	DirectCost	SubCMU	CostToPrime	PrimeCMU	ContractCost
Contract Cost Summary Report				**1,488,112**	**332,135**	**1,820,247**	**351,231**	**2,171,478**
				1,141,801.04		*1,417,029.32*		*1,690,456.35*
04 Dams	**1.00**	**EA**	**Sub**	**1,141,801**	**275,228**	**1,417,029**	**273,427**	**1,690,456**
				1,141,801.04		*1,417,029.32*		*1,690,456.35*
0401 Main Dam	**1.00**	**EA**	**Sub**	**1,141,801**	**275,228**	**1,417,029**	**273,427**	**1,690,456**
				2,508.59		*3,113.28*		*3,714.01*
Site Restoration	**1.00**	**EA**	**Sub**	**2,509**	**605**	**3,113**	**601**	**3,714**
				0.15		*0.18*		*0.22*
RSM 312216103300 Fine grading, slopes, gentle, finish grading (Note: This item covers grading for an area equal to the clearing and grubbing area.)	1,000.00	SY	Sub	147	36	183	35	218
				0.47		*0.58*		*0.70*
RSM 329219131000 Seeding, mechanical seeding hydro or air seeding for large areas, includes lime, fertilizer and seed (Note: This item covers seeding for an area equal to the clearing and grubbing area.)	1,000.00	SY	Sub	470	113	583	113	696
				1,891.20		*2,347.06*		*2,799.95*
Restore Portion of County Road 1273 as Gravel Road (Note: This item covers restoration for a 140-foot-long and 15-foot-wide section of County Road 1273.)	**1.00**	**EA**	**Sub**	**1,891**	**456**	**2,347**	**453**	**2,800**
				7.88		*9.78*		*11.67*
RSM 015523500050 Temporary, roads, gravel fill, 4" gravel depth, excl surfacing	240.00	SY	Sub	1,891	456	2,347	453	2,800
				23,582.09		*29,266.49*		*34,913.69*
Bracing (Note: Bracing is based on that used at KY River L&D3. The bracing consisted of heavy steel sections. The sections used here are similar, although some adjustments have been made to avoid using sections not found in the UPB. The quantities for each section used have been adapted for the geometry of the cells at Green River L&D3)	**1.00**	**EA**	**Sub**	**23,582**	**5,684**	**29,266**	**5,647**	**34,914**
				157.21		*195.11*		*232.76*
RSM 051223755760 Structural steel member, 100-ton project, 1 to 2 story building, W24x117, A992 steel, shop fabricated, incl shop primer, bolted connections	150.00	LF	Sub	23,582	5,684	29,266	5,647	34,914
				61,487.36		*76,308.73*		*91,033.11*
Tremie Concrete	**1.00**	**EA**	**Sub**	**61,487**	**14,821**	**76,309**	**14,724**	**91,033**
				128.10		*158.98*		*189.65*
USR USR_033105350020 Structural concrete, ready mix, normal weight, 2000 psi, includes local aggregate, sand, Portland cement and water, delivered, excludes all additives and treatments	480.00	CY	Sub	61,487	14,821	76,309	14,724	91,033
(Note: This item covers concrete for slush grouting the derrick stone and the timber frame repairs. This USR CSI Task for tremie concrete was built by copying the the 03 31 05 35 0200 CSI Task from the Cost Book which provided only material costs and adding the Tremie Concrete Crew for labor and equipment costs.Add $1.05 per CY for Environmental and Energy Charges and $14.00 per cubic yard for anti wash out treatment per direction from a quote from imi, a local concrete vendor. So total material price/CY is $106.55/CY. Production rate is 100 CY/Hour Based on experience at KY River L&D3 cell dam. The equipment for the crew for this task consists of 1 concrete pump, 2 cranes, 2 barges, 1 tug boat, and 1 front-end loader. The laborers for this crew consist of 5 semi-skilled laborers, 1 oiler, 1 medium equipment operator for the tug boat, 1 foreman, and 2 heavy equipment operators for the cranes. The volume of concrete for slush grouting (120 CY) was calculated by multiplying the plan area of derrick stone placement and slush grouting by an assumed depth. The assumed depth for slush grouting was calculated by assuming that the slush grouting will extend to half of the depth of the derrick stone (10 feet); therefore, the assumed depth of slush grouting was calculated as 5 feet. The volume of concrete for repairs to the timber frame (360 CY) was calculated by determining the timber crib surface area (beneath the reinforced concrete cap) and multiplying the area by an assumed placement depth of 2 feet.)									
				19,324.34		*23,982.42*		*28,610.02*

Currency in US dollars

Description	Quantity	UOM	Contractor	DirectCost	SubCMU	CostToPrime	PrimeCMU	ContractCost
Dewatering	**1.00**	**EA**	**Sub**	**19,324**	**4,658**	**23,982**	**4,628**	**28,610**
				772.97		*959.30*		*1,144.40*
RSM 312319200900 Dewatering, pumping, 8 hr., attended 8 hours per day, 3" centrifugal pump, includes 20 L.F. of suction hose and 100 L.F. of discharge hose	25.00	DAY	Sub	19,324	4,658	23,982	4,628	28,610
				35,177.59		*43,657.06*		*52,081.04*
Derrick Stone	**1.00**	**EA**	**Sub**	**35,178**	**8,479**	**43,657**	**8,424**	**52,081**
				60.62		*75.23*		*89.75*
USR USR Derrick Stone Placement	500.00	TON	Sub	30,309	7,306	37,615	7,258	44,873
(Note: The USR CSI Task for derrick stone was built by determining material costs, estimating a production rate, and creating a USR crew of equipment and laborers. Material cost from Greenville Quarries, Contact is John Stovall (270) 338-2300. $48/ton for derrick stone delivered by truck to site, includes unloading time for delivery and truck driver. Production rate of 100 tons/hour derived by calculating the total time for placement of 900 tons of derrick stone. The calculation of the total time to place all of the derrick stone accounted for the time to complete the following tasks: -unload the rock from the delivery truck; -load the rock onto the material transport barge; -travel time for the barge; -unload the rock from the barge; and -placement of the derrick stone. The production rate was calculated by dividing 900 tons by the total time to place 900 tons (9 hours) which equals 100 tons/hour. The quantity for derrick stone was calculated by determining the area of placement and multiplying by a depth of 10 feet to get the volume of stone in cubic yards. A unit weight of 110 lb/cubic foot that accounts for porosity was used to convert from cubic yards of stone to tons.)									
				9.74		*12.08*		*14.42*
USR USR Derrick Stone Placement	500.00	TON	Sub	4,869	1,174	6,042	1,166	7,208
(Note: The USR CSI Task for derrick stone was built by estimating a production rate and creating a USR crew of equipment and laborers.There is no material cost for this item since it assumed that half of the derrick stone will be obtained from dredging and reused. Production rate of 100 tons/hour derived by calculating the total time for placement of 900 tons of derrick stone. The calculation of the total time to place all of the derrick stone accounted for the time to complete the following tasks: -unload the rock from the delivery truck; -load the rock onto the material transport barge; -travel time for the barge; -unload the rock from the barge; and -placement of the derrick stone. The production rate was calculated by dividing 900 tons by the total time to place 900 tons (9 hours) which equals 100 tons/hour. The quantity for derrick stone was calculated by determining the area of placement and multiplying by a depth of 10 feet to get the volume of stone in cubic yards. A unit weight of 110 lb/cubic foot that accounts for porosity was used to convert from cubic yards of stone to tons.)									
				84,736.51		*105,162.03*		*125,453.88*
Dredging	**1.00**	**EA**	**Sub**	**84,737**	**20,426**	**105,162**	**20,292**	**125,454**
				13.54		*16.80*		*20.04*
RSM 352023130310 Mechanical dredging, 20 miles, barge mounted clamshell excavation into scows, dumped at sea, minimum	1,900.00	BCY	Sub	25,721	6,200	31,921	6,159	38,081
(Note: The dredging volume was calculated by first asssuming that the total dredging volume is equal to the concrete cap volume plus additional dredging needed upstream of the sheet piles. The additional dredging volume was calculated by (1) dividing the dredging area into sections in plan view, (2) multiplying the plan area of each section by the average of the excavation depths at the beginning of the section and end of the section to get a volume, and (3) adding the volumes of each section to get a total dredging volume.)								
				28.10		*34.88*		*41.61*
USR USR Spoil Disposal	2,100.00	LCY	Sub	59,015	14,225	73,241	14,132	87,373
(Note: Increase cost for hauling item by 1.5 since it is for a haul distance of 10 miles and the assumed haul distance for the project is 15 miles. Spoil Disposal Volume = Total Dredging Volume - 338 CY for derrick stone to be reused x 1.30 (bulking factor for excavated soils).)								
				301,521.49		*374,202.50*		*446,407.83*
Sheet Piling	**1.00**	**EA**	**Sub**	**301,521**	**72,681**	**374,202**	**72,205**	**446,408**
				36.52		*45.32*		*54.07*
USR USR PZ22 Sheet Piling	7,875.00	SF	Sub	287,594	69,324	356,918	68,870	425,788
(Note: The USR CSI Task for sheet piling was built by determining material costs, estimating a production rate, and creating a USR crew of equipment and laborers. Material Quote from Skyline Steel - Alex Grainger (West Chester, OH office - 513-777-7039) = $0.83 per LB x 22 LB/SF (Skyline) = $18.26/SF delivered for PZ22 sheet piling for piles <=50 ft in length. Production rate estimated from Stantec's experience at KY River L&D3 with constructing a cell dam. Production rate was 5 days/main cell and the average square footage of piling per main cell was 3,430 SF/main cell. The equipment for the crew consists of 2 cranes, 2 barges, 1 tug boat, and 1 pile hammer. The labor for the crew for this task consists of 1 medium equipment operator that serves as the tug boat captain, 2 heavy equipment operators for the cranes, 1 equipment oiler, 2 pile drivers, and one half-time pile driver foreman. The sheet piling quantity was calculated by (1) dividing the length of the dam into sections, (2) multiplying									

Currency in US dollars

Description	Quantity	UOM	Contractor	DirectCost	SubCMU	CostToPrime	PrimeCMU	ContractCost
the average of the height of the crest to the rock elevation at the beginning station and ending station by the width of the section, and (3) adding the area of sheet piling for each section for the total area of sheet piling.)								
				21.30		*26.43*		*31.54*
RSM 051223200300 Curb edging, structural steel angle w/ anchors, on concrete forms, 8.2 plf, 4" x 4", shop fabricated	230.00	LF	Sub	4,899	1,181	6,080	1,173	7,253
(Note: This item covers materials to pin the upstream sheets to the reinforcement in the concrete cap.)								
				19.63		*24.36*		*29.06*
RSM 050521901610 Welding structural steel in field, single pass, 0.4 Lb/LF, 5/16" thick, continuous fillet, type 6011	460.00	LF	Sub	9,029	2,176	11,205	2,162	13,367
(Note: This item covers the welding of the pin reinforcement to the sheet piles.)								
				613,463.06		*761,336.80*		*908,242.77*
Reinforced Concrete	**1.00**	**EA**	**Sub**	**613,463**	**147,874**	**761,337**	**146,906**	**908,243**
(Note: The volume of reinforced concrete for the cap was calculated by multiplying the cross-sectional area of the cap in section view by the length of the dam.)								
				461.25		*572.43*		*682.89*
RSM 033053404500 Structural concrete, in place, free-standing wall (3000 psi), 15" thick x 18' high, includes forms(4 uses), reinforcing steel, concrete, placing and finishing	1,330.00	CY	Sub	613,463	147,874	761,337	146,906	908,243
(Note: This item covers the concrete for the concrete cap.)								
				236,080.10		*292,986.62*		*349,520.71*
05 Locks	**1.00**	**EA**	**Sub**	**236,080**	**56,907**	**292,987**	**56,534**	**349,521**
				1,214.83		*1,507.66*		*1,798.58*
Demolish Railing Parallel to Land Lock Wall	**1.00**	**EA**	**Sub**	**1,215**	**293**	**1,508**	**291**	**1,799**
				2.58		*3.20*		*3.82*
RSM 024113660500 Selective demolition, misc metal fences & gates, metal tubular picket fences, 4'-6' high	320.00	LF	Sub	826	199	1,025	198	1,223
				25.93		*32.18*		*38.39*
RSM 024119180200 Selective demolition, disposal only, urban buildings with salvage value allowed, steel frame, includes loading and 5 mile haul to dump	15.00	CY	Sub	389	94	483	93	576
(Note: Increase bare cost by a factor of 3.0 since a 15-mile haul to dump is assumed for the project. Disposal Volume = 2 x Volume of posts and rails to account for bulking.)								
				12,671.78		*15,726.28*		*18,760.79*
Replace Railing Parallel to Land Lock Wall	**1.00**	**EA**	**Sub**	**12,672**	**3,055**	**15,726**	**3,035**	**18,761**
				39.60		*49.14*		*58.63*
RSM 055213500520 Railing, pipe, steel, primed, 2 rails, 3'-6" high, posts @ 5' O.C., 1-1/2" dia, shop fabricated	320.00	LF	Sub	12,672	3,055	15,726	3,035	18,761
				177.00		*219.66*		*262.05*
Safety Signage	**1.00**	**EA**	**Sub**	**177**	**43**	**220**	**42**	**262**
				29.50		*36.61*		*43.67*
HTW 019413207911 Safety signs (yellow and magenta), aluminum/acrylic, 10" x 14"	6.00	EA	Sub	177	43	220	42	262
				120,169.81		*149,136.45*		*177,913.51*
Dredging to Open Gates	**1.00**	**EA**	**Sub**	**120,170**	**28,967**	**149,136**	**28,777**	**177,914**

Labor ID: KY100192 EQ ID: EP09R02 Currency in US dollars TRACES MII Version 4.1

Description	Quantity	UOM	Contractor	DirectCost	SubCMU	CostToPrime	PrimeCMU	ContractCost
				13.54		*16.80*		*20.04*
RSM 352023130310 Mechanical dredging, 20 miles, barge mounted clamshell excavation into scows, dumped at sea, minimum	2,400.00	BCY	Sub	32,490	7,832	40,322	7,780	48,102
(Note: The dredging volume was calculated by (1) dividing the dredging area into sections in plan view, (2) multiplying the plan area of each section by the average of the excavation depths at the beginning of the section and end of the section to get a volume, and (3) adding the volumes of each section to get a total dredging volume.)								
				28.10		*34.88*		*41.61*
USR USR Spoil Disposal	3,120.00	LCY	Sub	87,680	21,135	108,815	20,997	129,812
(Note: Increase cost for hauling item by 1.5 since it is for a haul distance of 10 miles and the assumed haul distance for the project is 15 miles. Spoil Disposal Volume = Total Dredging Volume x 1.30 (bulking factor for excavated soils).)								
				18,516.47		*22,979.82*		*27,413.96*
Steel For Pinning Gates	**1.00**	**EA**	**Sub**	**18,516**	**4,463**	**22,980**	**4,434**	**27,414**
(Note: The tie-back consists of a W section, a thin steel plate, and an anchor rod. The W-section size was assumed to be a W8x58 section based on similar designs at Kentucky River Lock No. 5, 6, & 7. Since this size was unavailable in 2010 RS Means, the larger W12x58 was chosen. The extra material and cost of the W12x58 was assumed to account for the steel required for the steel plate and anchor rod. Due to limited design drawings, the actual geometry of the lock gates and stiffeners is unknown. Therefore, the length of the weld between the W section and the gate stiffener was assumed to be 6 linear feet per W section.)								
				81.02		*100.55*		*119.95*
RSM 051223751580 Structural steel member, 100-ton project, 1 to 2 story building, W12x58, A992 steel, shop fabricated, incl shop primer, bolted connections	130.00	LF	Sub	10,532	2,539	13,071	2,522	15,593
				19.63		*24.36*		*29.06*
RSM 050521901610 Welding structural steel in field, single pass, 0.4 Lb/LF, 5/16" thick, continuous fillet, type 6011	100.00	LF	Sub	1,963	473	2,436	470	2,906
				60.22		*74.73*		*89.15*
RSM 050521904010 Welding structural steel in field, cleaning & welding plates/bars/rods to existing beams/columns/trusses	100.00	LF	Sub	6,022	1,451	7,473	1,442	8,915
				11,129.49		*13,812.23*		*16,477.40*
Restore Concrete Esplanade	**1.00**	**EA**	**Sub**	**11,129**	**2,683**	**13,812**	**2,665**	**16,477**
(Note: Total area of esplanade is 867 SY. Assume 50% of esplanade will need restoration.)								
				24.73		*30.69*		*36.62*
RSM 321313230020 Concrete paving surface treatment, 4500 psi, fixed form, unreinforced, 12' pass, 6" thick, includes joints, finishing, and curing	450.00	SY	Sub	11,129	2,683	13,812	2,665	16,477
(Note: Total area of esplanade is 867 SY. Assume 50% of esplanade will need restoration.)								
				8,608.57		*10,683.64*		*12,745.13*
Concrete Sawing	**1.00**	**EA**	**Sub**	**8,609**	**2,075**	**10,684**	**2,061**	**12,745**
				122.98		*152.62*		*182.07*
RSM 038116500800 Concrete sawing, concrete walls, plain, per inch of depth, hydraulic saw	70.00	LF	Sub	8,609	2,075	10,684	2,061	12,745
(Note: Multiply original price of $4.22 per inch of depth/LF by 24 to account for 6-inch depth and 24-inch-thick bulkhead wall (assume that it takes 4 cuts to cut out 2-foot-wide and 6-inch-deep key. Quantity in LF of concrete sawing is equal to the length of the bottom of the wall (42 feet) plus the height of the wall (12.9 ft) per side x 2 sides.)								
				13,606.39		*16,886.18*		*20,144.50*
Temporary Bulkhead Bracing	**1.00**	**EA**	**Sub**	**13,606**	**3,280**	**16,886**	**3,258**	**20,145**
(Note: Bracing is based on that used at KY River L&D3. The bracing consisted of heavy steel sections. The sections used here are similar, although some adjustments have been made to avoid using sections not found in the UPB. The quantities for each section used have been adapted for the geometry of the cells at Green River L&D3.)								

Currency in US dollars

Description	Quantity	UOM	Contractor	DirectCost	SubCMU	CostToPrime	PrimeCMU	ContractCost
				113.39		*140.72*		*167.87*
RSM 051223757500 Structural steel member, 100-ton project, 1 to 2 story building, W36x150, A992 steel, shop fabricated, incl shop primer, bolted connections	120.00	LF	Sub	13,606	3,280	16,886	3,258	20,145
(Note: Reduce bare cost of $186.71 by 57% to $106.42 since steel will be salvaged. The 57% discount was calculated by taking the total bare cost (labor, equipment, and materials) for salvaged PZ22 Sheet Piling from 2010 RS Means 31 41 16 10 1600 and dividing by the Stantec derived unit rate of $36.89 for PZ22 Sheet Piling (labor, equipment, and materials) that included sheet piling purchased from the manufacturer.)								
				22,140.02		*27,476.82*		*32,778.69*
Reinforced Concrete	**1.00**	**EA**	**Sub**	**22,140**	**5,337**	**27,477**	**5,302**	**32,779**
				461.25		*572.43*		*682.89*
RSM 033053404500 Structural concrete, in place, free-standing wall (3000 psi), 15" thick x 18' high, includes forms(4 uses), reinforcing steel, concrete, placing and finishing	48.00	CY	Sub	22,140	5,337	27,477	5,302	32,779
(Note: This item covers the concrete for the bulkhead wall and splash pad. The volume of concrete is equal to the volume of the bulkhead wall (width x length x height) and the splash pad (plan area of splash pad x height).)								
				11,594.60		*14,389.45*		*17,166.01*
Dewatering	**1.00**	**EA**	**Sub**	**11,595**	**2,795**	**14,389**	**2,777**	**17,166**
				772.97		*959.30*		*1,144.40*
RSM 312319200900 Dewatering, pumping, 8 hr., attended 8 hours per day, 3" centrifugal pump, includes 20 L.F. of suction hose and 100 L.F. of discharge hose	15.00	DAY	Sub	11,595	2,795	14,389	2,777	17,166
(Note: The quantity for days of dewatering was calculated by estimating the total duration using the produciton rates and quantities for pinning the gates, welding, concrete cutting, installing the sheet piles, installing the bracing, and constructing the bulkhead wall and splash pad.)								
				16,251.13		*20,168.42*		*24,060.08*
Sheet Piling	**1.00**	**EA**	**Sub**	**16,251**	**3,917**	**20,168**	**3,892**	**24,060**
				20.31		*25.21*		*30.08*
RSM 314116101600 Sheet piling, steel, 27 psf, 20' excavation, drive, extract and salvage, excludes wales	800.00	SF	Sub	16,251	3,917	20,168	3,892	24,060
(Note: The area for temporary sheet piling was calculated by multiplying the height of the temporary bulkhead wall by the width of the lock chamber.)								
				110,231.00		*110,231.00*		*131,500.94*
30 Planning, Engineering and Design	**1.00**	**EA**	**Prime**	**110,231**	**0**	**110,231**	**21,270**	**131,501**
(Note: Costs based on 8% of Project Direct Cost per James J. Vermillion, CCC, Cost Engineer, USACE Louisville District.)								
USR USR Planning, Engineering, & Design	1.00	LS	Prime	110,231	0	110,231	21,270	131,501
(Note: Costs based on 8% of Project Direct Cost per James J. Vermillion, CCC, Cost Engineer, USACE Louisville District. Used 8% of $1,377,881 which corresponds to the total project direct costs for all items except for Planning, Engineering, & Design.)								

Currency in US dollars

Description	Quantity	UOM	DirectLabor	DirectEQ	DirectMatl	DirectSubBid	DirectUserCost	DirectCost	DirectCost	CostOverride
Project Direct Costs Report			**597,533**	**239,455**	**540,893**	**110,231**	**0**	**1,488,112**	**1,488,112**	
			488,292.00	*168,811.32*	*484,697.72*	*0.00*		*1,141,801.04*	*1,141,801.04*	
04 Dams	**1.00**	**EA**	**488,292**	**168,811**	**484,698**	**0**	**0**	**1,141,801**	**1,141,801**	
			488,292.00	*168,811.32*	*484,697.72*	*0.00*		*1,141,801.04*	*1,141,801.04*	
0401 Main Dam	**1.00**	**EA**	**488,292**	**168,811**	**484,698**	**0**	**0**	**1,141,801**	**1,141,801**	
			1,071.49	*218.10*	*1,219.00*	*0.00*		*2,508.59*	*2,508.59*	
Site Restoration	**1.00**	**EA**	**1,071**	**218**	**1,219**	**0**	**0**	**2,509**	**2,509**	
			0.11	*0.04*	*0.00*	*0.00*		*0.15*	*0.15*	
RSM 312216103300 Fine grading, slopes, gentle, finish grading (Note: This item covers grading for an area equal to the clearing and grubbing area.)	1,000.00	SY	108	40	0	0	0	147	147	N
			0.14	*0.12*	*0.20*	*0.00*		*0.47*	*0.47*	
RSM 329219131000 Seeding, mechanical seeding hydro or air seeding for large areas, includes lime, fertilizer and seed (Note: This item covers seeding for an area equal to the clearing and grubbing area.) (Note: This item covers restoration for a 140-foot-long and 15-foot-wide section of County Road 1273.)	1,000.00	SY	144	124	201	0	0	470	470	N
			3.41	*0.23*	*4.24*	*0.00*		*7.88*	*7.88*	
RSM 015523500050 Temporary, roads, gravel fill, 4" gravel depth, excl surfacing	240.00	SY	819	54	1,018	0	0	1,891	1,891	N
			845.20	*158.89*	*22,578.00*	*0.00*		*23,582.09*	*23,582.09*	
Bracing (Note: Bracing is based on that used at KY River L&D3. The bracing consisted of heavy steel sections. The sections used here are similar, although some adjustments have been made to avoid using sections not found in the UPB. The quantities for each section used have been adapted for the geometry of the cells at Green River L&D3)	**1.00**	**EA**	**845**	**159**	**22,578**	**0**	**0**	**23,582**	**23,582**	
			5.63	*1.06*	*150.52*	*0.00*		*157.21*	*157.21*	
RSM 051223755760 Structural steel member, 100-ton project, 1 to 2 story building, W24x117, A992 steel, shop fabricated, incl shop primer, bolted connections	150.00	LF	845	159	22,578	0	0	23,582	23,582	N
			3,141.37	*4,133.35*	*54,212.64*	*0.00*		*61,487.36*	*61,487.36*	
Tremie Concrete	**1.00**	**EA**	**3,141**	**4,133**	**54,213**	**0**	**0**	**61,487**	**61,487**	
			6.54	*8.61*	*112.94*	*0.00*		*128.10*	*128.10*	
USR USR_033105350020 Structural concrete, ready mix, normal weight, 2000 psi, includes local aggregate, sand, Portland cement and water, delivered, excludes all additives and treatments (Note: This item covers concrete for slush grouting the derrick stone and the timber frame repairs. This USR CSI Task for tremie concrete was built by copying the the 03 31 05 35 0200 CSI Task from the Cost Book which provided only material costs and adding the Tremie Concrete Crew for labor and equipment costs.Add $1.05 per CY for Environmental and Energy Charges and $14.00 per cubic yard for anti wash out treatment per direction from a quote from imi, a local concrete vendor. So total material price/CY is $106.55/CY. Production rate is 100 CY/Hour Based on experience at KY River L&D3 cell	480.00	CY	3,141	4,133	54,213	0	0	61,487	61,487	M

Currency in US dollars

Description	Quantity	UOM	DirectLabor	DirectEQ	DirectMatl	DirectSubBid	DirectUserCost	DirectCost	DirectCost	CostOverride
dam. The equipment for the crew for this task consists of 1 concrete pump, 2 cranes, 2 barges, 1 tug boat, and 1 front-end loader. The laborers for this crew consist of 5 semi-skilled laborers, 1 oiler, 1 medium equipment operator for the tug boat, 1 foreman, and 2 heavy equipment operators for the cranes. The volume of concrete for slush grouting (120 CY) was calculated by multiplying the plan area of derrick stone placement and slush grouting by an assumed depth. The assumed depth for slush grouting was calculated by assuming that the slush grouting will extend to half of the depth of the derrick stone (10 feet); therefore, the assumed depth of slush grouting was calculated as 5 feet. The volume of concrete for repairs to the timber frame (360 CY) was calculated by determining the timber crib surface area (beneath the reinforced concrete cap) and multiplying the area by an assumed placement depth of 2 feet.)										
			18,574.22	*750.12*	*0.00*	*0.00*		*19,324.34*	*19,324.34*	
Dewatering	**1.00**	**EA**	**18,574**	**750**	**0**	**0**	**0**	**19,324**	**19,324**	
			742.97	*30.00*	*0.00*	*0.00*		*772.97*	*772.97*	
RSM 312319200900 Dewatering, pumping, 8 hr., attended 8 hours per day, 3" centrifugal pump, includes 20 L.F. of suction hose and 100 L.F. of discharge hose	25.00	DAY	18,574	750	0	0	0	19,324	19,324	N
			3,179.62	*6,557.97*	*25,440.00*	*0.00*		*35,177.59*	*35,177.59*	
Derrick Stone	**1.00**	**EA**	**3,180**	**6,558**	**25,440**	**0**	**0**	**35,178**	**35,178**	
			3.18	*6.56*	*50.88*	*0.00*		*60.62*	*60.62*	
USR USR Derrick Stone Placement	500.00	TON	1,590	3,279	25,440	0	0	30,309	30,309	N
(Note: The USR CSI Task for derrick stone was built by determining material costs, estimating a production rate, and creating a USR crew of equipment and laborers. Material cost from Greenville Quarries, Contact is John Stovall (270) 338-2300. $48/ton for derrick stone delivered by truck to site, includes unloading time for delivery and truck driver. Production rate of 100 tons/hour derived by calculating the total time for placement of 900 tons of derrick stone. The calculation of the total time to place all of the derrick stone accounted for the time to complete the following tasks: -unload the rock from the delivery truck; -load the rock onto the material transport barge; -travel time for the barge; -unload the rock from the barge; and -placement of the derrick stone. The production rate was calculated by dividing 900 tons by the total time to place 900 tons (9 hours) which equals 100 tons/hour. The quantity for derrick stone was calculated by determining the area of placement and multiplying by a depth of 10 feet to get the volume of stone in cubic yards. A unit weight of 110 lb/cubic foot that accounts for porosity was used to convert from cubic yards of stone to tons.)										
			3.18	*6.56*	*0.00*	*0.00*		*9.74*	*9.74*	
USR USR Derrick Stone Placement	500.00	TON	1,590	3,279	0	0	0	4,869	4,869	M
(Note: The USR CSI Task for derrick stone was built by estimating a production rate and creating a USR crew of equipment and laborers.There is no material cost for this item since it assumed that half of the derrick stone will be obtained from dredging and reused. Production rate of 100 tons/hour derived by calculating the total time for placement of 900 tons of derrick stone. The calculation of the total time to place all of the derrick stone accounted for the time to complete the following tasks: -unload the rock from the delivery truck; -load the rock onto the material transport barge; -travel time for the barge; -unload the rock from the barge; and -placement of the derrick stone. The production rate was calculated by dividing 900 tons by the total time to place 900 tons (9 hours) which equals 100 tons/hour. The quantity for derrick stone was calculated by determining the area of placement and multiplying by a depth of 10 feet to get the volume of stone in cubic yards. A unit weight of 110 lb/cubic foot that accounts for porosity was used to convert from cubic yards of stone to tons.)										
			42,453.05	*42,283.46*	*0.00*	*0.00*		*84,736.51*	*84,736.51*	
Dredging	**1.00**	**EA**	**42,453**	**42,283**	**0**	**0**	**0**	**84,737**	**84,737**	
			8.41	*5.13*	*0.00*	*0.00*		*13.54*	*13.54*	
RSM 352023130310 Mechanical dredging, 20 miles, barge mounted clamshell excavation into scows, dumped at sea, minimum	1,900.00	BCY	15,979	9,742	0	0	0	25,721	25,721	N
(Note: The dredging volume was calculated by first asssuming that the total dredging volume is equal to the concrete cap volume plus additional dredging needed upstream of the sheet piles. The additional dredging volume was calculated by (1) dividing the dredging area into sections in plan view, (2) multiplying the plan area of each section by the average of the excavation depths at the beginning of the section and end of the section to get a volume, and (3) adding the volumes of each section to get a total dredging volume.)										
			12.61	*15.50*	*0.00*	*0.00*		*28.10*	*28.10*	
USR USR Spoil Disposal	2,100.00	LCY	26,474	32,541	0	0	0	59,015	59,015	N

Currency in US dollars

Description	Quantity	UOM	DirectLabor	DirectEQ	DirectMatl	DirectSubBid	DirectUserCost	DirectCost	DirectCost	CostOverride
(Note: Increase cost for hauling item by 1.5 since it is for a haul distance of 10 miles and the assumed haul distance for the project is 15 miles. Spoil Disposal Volume = Total Dredging Volume - 338 CY for derrick stone to be reused x 1.30 (bulking factor for excavated soils).)										
			59,263.11	*86,578.31*	*155,680.08*	*0.00*		*301,521.49*	*301,521.49*	
Sheet Piling	**1.00**	**EA**	**59,263**	**86,578**	**155,680**	**0**	**0**	**301,521**	**301,521**	
			6.30	*10.87*	*19.36*	*0.00*		*36.52*	*36.52*	
USR USR PZ22 Sheet Piling	7,875.00	SF	49,596	85,573	152,425	0	0	287,594	287,594	N
(Note: The USR CSI Task for sheet piling was built by determining material costs, estimating a production rate, and creating a USR crew of equipment and laborers. Material Quote from Skyline Steel - Alex Grainger (West Chester, OH office - 513-777-7039) = $0.83 per LB x 22 LB/SF (Skyline) = $18.26/SF delivered for PZ22 sheet piling for piles <=50 ft in length. Production rate estimated from Stantec's experience at KY River L&D3 with constructing a cell dam. Production rate was 5 days/main cell and the average square footage of piling per main cell was 3,430 SF/main cell. The equipment for the crew consists of 2 cranes, 2 barges, 1 tug boat, and 1 pile hammer. The labor for the crew for this task consists of 1 medium equipment operator that serves as the tug boat captain, 2 heavy equipment operators for the cranes, 1 equipment oiler, 2 pile drivers, and one half-time pile driver foreman. The sheet piling quantity was calculated by (1) dividing the length of the dam into sections, (2) multiplying the average of the height of the crest to the rock elevation at the beginning station and ending station by the width of the section, and (3) adding the area of sheet piling for each section for the total area of sheet piling.)										
			8.88	*0.28*	*12.14*	*0.00*		*21.30*	*21.30*	
RSM 051223200300 Curb edging, structural steel angle w/ anchors, on concrete forms, 8.2 plf, 4" x 4", shop fabricated	230.00	LF	2,043	65	2,792	0	0	4,899	4,899	N
(Note: This item covers materials to pin the upstream sheets to the reinforcement in the concrete cap.)										
			16.58	*2.04*	*1.01*	*0.00*		*19.63*	*19.63*	
RSM 050521901610 Welding structural steel in field, single pass, 0.4 Lb/LF, 5/16" thick, continuous fillet, type 6011	460.00	LF	7,625	941	463	0	0	9,029	9,029	N
(Note: This item covers the welding of the pin reinforcement to the sheet piles.)										
			359,763.94	*28,131.13*	*225,568.00*	*0.00*		*613,463.06*	*613,463.06*	
Reinforced Concrete	**1.00**	**EA**	**359,764**	**28,131**	**225,568**	**0**	**0**	**613,463**	**613,463**	
(Note: The volume of reinforced concrete for the cap was calculated by multiplying the cross-sectional area of the cap in section view by the length of the dam.)										
			270.50	*21.15*	*169.60*	*0.00*		*461.25*	*461.25*	
RSM 033053404500 Structural concrete, in place, free-standing wall (3000 psi), 15" thick x 18' high, includes forms(4 uses), reinforcing steel, concrete, placing and finishing	1,330.00	CY	359,764	28,131	225,568	0	0	613,463	613,463	N
(Note: This item covers the concrete for the concrete cap.)										
			109,241.19	*70,643.24*	*56,195.67*	*0.00*		*236,080.10*	*236,080.10*	
05 Locks	**1.00**	**EA**	**109,241**	**70,643**	**56,196**	**0**	**0**	**236,080**	**236,080**	
			949.17	*265.67*	*0.00*	*0.00*		*1,214.83*	*1,214.83*	
Demolish Railing Parallel to Land Lock Wall	**1.00**	**EA**	**949**	**266**	**0**	**0**	**0**	**1,215**	**1,215**	
			2.26	*0.32*	*0.00*	*0.00*		*2.58*	*2.58*	
RSM 024113660500 Selective demolition, misc metal fences & gates, metal tubular	320.00	LF	723	103	0	0	0	826	826	N

Currency in US dollars

Description	Quantity	UOM	DirectLabor	DirectEQ	DirectMatl	DirectSubBid	DirectUserCost	DirectCost	DirectCost	CostOverride
picket fences, 4'-6' high										
			15.10	*10.83*	*0.00*	*0.00*		*25.93*	*25.93*	
RSM 024119180200 Selective demolition, disposal only, urban buildings with salvage value allowed, steel frame, includes loading and 5 mile haul to dump	15.00	CY	227	162	0	0	0	389	389	LE
(Note: Increase bare cost by a factor of 3.0 since a 15-mile haul to dump is assumed for the project. Disposal Volume = 2 x Volume of posts and rails to account for bulking.)										
			4,884.38	*155.40*	*7,632.00*	*0.00*		*12,671.78*	*12,671.78*	
Replace Railing Parallel to Land Lock Wall	**1.00**	**EA**	**4,884**	**155**	**7,632**	**0**	**0**	**12,672**	**12,672**	
			15.26	*0.49*	*23.85*	*0.00*		*39.60*	*39.60*	
RSM 055213500520 Railing, pipe, steel, primed, 2 rails, 3'-6" high, posts @ 5' O.C., 1-1/2" dia, shop fabricated	320.00	LF	4,884	155	7,632	0	0	12,672	12,672	N
			0.00	*0.00*	*177.00*	*0.00*		*177.00*	*177.00*	
Safety Signage	**1.00**	**EA**	**0**	**0**	**177**	**0**	**0**	**177**	**177**	
			0.00	*0.00*	*29.50*	*0.00*		*29.50*	*29.50*	
HTW 019413207911 Safety signs (yellow and magenta), aluminum/acrylic, 10" x 14"	6.00	EA	0	0	177	0	0	177	177	N
			59,516.88	*60,652.94*	*0.00*	*0.00*		*120,169.81*	*120,169.81*	
Dredging to Open Gates	**1.00**	**EA**	**59,517**	**60,653**	**0**	**0**	**0**	**120,170**	**120,170**	
			8.41	*5.13*	*0.00*	*0.00*		*13.54*	*13.54*	
RSM 352023130310 Mechanical dredging, 20 miles, barge mounted clamshell excavation into scows, dumped at sea, minimum	2,400.00	BCY	20,184	12,306	0	0	0	32,490	32,490	N
(Note: The dredging volume was calculated by (1) dividing the dredging area into sections in plan view, (2) multiplying the plan area of each section by the average of the excavation depths at the beginning of the section and end of the section to get a volume, and (3) adding the volumes of each section to get a total dredging volume.)										
			12.61	*15.50*	*0.00*	*0.00*		*28.10*	*28.10*	
USR USR Spoil Disposal	3,120.00	LCY	39,333	48,347	0	0	0	87,680	87,680	N
(Note: Increase cost for hauling item by 1.5 since it is for a haul distance of 10 miles and the assumed haul distance for the project is 15 miles. Spoil Disposal Volume = Total Dredging Volume x 1.30 (bulking factor for excavated soils).)										
			7,613.40	*1,031.29*	*9,871.78*	*0.00*		*18,516.47*	*18,516.47*	
Steel For Pinning Gates	**1.00**	**EA**	**7,613**	**1,031**	**9,872**	**0**	**0**	**18,516**	**18,516**	
(Note: The tie-back consists of a W section, a thin steel plate, and an anchor rod. The W-section size was assumed to be a W8x58 section based on similar designs at Kentucky River Lock No. 5, 6, & 7. Since this size was unavailable in 2010 RS Means, the larger W12x58 was chosen. The extra material and cost of the W12x58 was assumed to account for the steel required for the steel plate and anchor rod. Due to limited design drawings, the actual geometry of the lock gates and stiffeners is unknown. Therefore, the length of the weld between the W section and the gate stiffener was assumed to be 6 linear feet per W section.)										
			5.44	*1.38*	*74.20*	*0.00*		*81.02*	*81.02*	
RSM 051223751580 Structural steel member, 100-ton project, 1 to 2 story building, W12x58, A992 steel, shop	130.00	LF	707	179	9,646	0	0	10,532	10,532	N

Currency in US dollars

Description	Quantity	UOM	DirectLabor	DirectEQ	DirectMatl	DirectSubBid	DirectUserCost	DirectCost	DirectCost	CostOverride
fabricated, incl shop primer, bolted connections										
			16.58	*2.04*	*1.01*	*0.00*		*19.63*	*19.63*	
RSM 050521901610 Welding structural steel in field, single pass, 0.4 Lb/LF, 5/16" thick, continuous fillet, type 6011	100.00	LF	1,658	204	101	0	0	1,963	1,963	N
			52.49	*6.47*	*1.25*	*0.00*		*60.22*	*60.22*	
RSM 050521904010 Welding structural steel in field, cleaning & welding plates/bars/rods to existing beams/columns/trusses	100.00	LF	5,249	647	125	0	0	6,022	6,022	N
			786.12	*326.37*	*10,017.00*	*0.00*		*11,129.49*	*11,129.49*	
Restore Concrete Esplanade	**1.00**	**EA**	**786**	**326**	**10,017**	**0**	**0**	**11,129**	**11,129**	
(Note: Total area of esplanade is 867 SY. Assume 50% of esplanade will need restoration.)										
			1.75	*0.73*	*22.26*	*0.00*		*24.73*	*24.73*	
RSM 321313230020 Concrete paving surface treatment, 4500 psi, fixed form, unreinforced, 12' pass, 6" thick, includes joints, finishing, and curing	450.00	SY	786	326	10,017	0	0	11,129	11,129	N
(Note: Total area of esplanade is 867 SY. Assume 50% of esplanade will need restoration.)										
			3,943.21	*3,864.00*	*801.36*	*0.00*		*8,608.57*	*8,608.57*	
Concrete Sawing	**1.00**	**EA**	**3,943**	**3,864**	**801**	**0**	**0**	**8,609**	**8,609**	
			56.33	*55.20*	*11.45*	*0.00*		*122.98*	*122.98*	
RSM 038116500800 Concrete sawing, concrete walls, plain, per inch of depth, hydraulic saw	70.00	LF	3,943	3,864	801	0	0	8,609	8,609	LEM
(Note: Multiply original price of $4.22 per inch of depth/LF by 24 to account for 6-inch depth and 24-inch-thick bulkhead wall (assume that it takes 4 cuts to cut out 2-foot-wide and 6-inch-deep key. Quantity in LF of concrete sawing is equal to the length of the bottom of the wall (42 feet) plus the height of the wall (12.9 ft) per side x 2 sides.)										
			345.87	*64.80*	*13,195.73*	*0.00*		*13,606.39*	*13,606.39*	
Temporary Bulkhead Bracing	**1.00**	**EA**	**346**	**65**	**13,196**	**0**	**0**	**13,606**	**13,606**	
(Note: Bracing is based on that used at KY River L&D3. The bracing consisted of heavy steel sections. The sections used here are similar, although some adjustments have been made to avoid using sections not found in the UPB. The quantities for each section used have been adapted for the geometry of the cells at Green River L&D3.)										
			2.88	*0.54*	*109.96*	*0.00*		*113.39*	*113.39*	
RSM 051223757500 Structural steel member, 100-ton project, 1 to 2 story building, W36x150, A992 steel, shop fabricated, incl shop primer, bolted connections	120.00	LF	346	65	13,196	0	0	13,606	13,606	LEM
(Note: Reduce bare cost of $186.71 by 57% to $106.42 since steel will be salvaged. The 57% discount was calculated by taking the total bare cost (labor, equipment, and materials) for salvaged PZ22 Sheet Piling from 2010 RS Means 31 41 16 10 1600 and dividing by the Stantec derived unit rate of $36.89 for PZ22 Sheet Piling (labor, equipment, and materials) that included sheet piling purchased from the manufacturer.)										
			12,983.96	*1,015.26*	*8,140.80*	*0.00*		*22,140.02*	*22,140.02*	

Currency in US dollars

Description	Quantity	UOM	DirectLabor	DirectEQ	DirectMatl	DirectSubBid	DirectUserCost	DirectCost	DirectCost	CostOverride
Reinforced Concrete	**1.00**	**EA**	**12,984**	**1,015**	**8,141**	**0**	**0**	**22,140**	**22,140**	
			270.50	*21.15*	*169.60*	*0.00*		*461.25*	*461.25*	
RSM 033053404500 Structural concrete, in place, free-standing wall (3000 psi), 15" thick x 18' high, includes forms(4 uses), reinforcing steel, concrete, placing and finishing	48.00	CY	12,984	1,015	8,141	0	0	22,140	22,140	N
(Note: This item covers the concrete for the bulkhead wall and splash pad. The volume of concrete is equal to the volume of the bulkhead wall (width x length x height) and the splash pad (plan area of splash pad x height).)										
			11,144.53	*450.07*	*0.00*	*0.00*		*11,594.60*	*11,594.60*	
Dewatering	**1.00**	**EA**	**11,145**	**450**	**0**	**0**	**0**	**11,595**	**11,595**	
			742.97	*30.00*	*0.00*	*0.00*		*772.97*	*772.97*	
RSM 312319200900 Dewatering, pumping, 8 hr., attended 8 hours per day, 3" centrifugal pump, includes 20 L.F. of suction hose and 100 L.F. of discharge hose	15.00	DAY	11,145	450	0	0	0	11,595	11,595	N
(Note: The quantity for days of dewatering was calculated by estimating the total duration using the produciton rates and quantities for pinning the gates, welding, concrete cutting, installing the sheet piles, installing the bracing, and constructing the bulkhead wall and splash pad.)										
			7,073.68	*2,817.45*	*6,360.00*	*0.00*		*16,251.13*	*16,251.13*	
Sheet Piling	**1.00**	**EA**	**7,074**	**2,817**	**6,360**	**0**	**0**	**16,251**	**16,251**	
			8.84	*3.52*	*7.95*	*0.00*		*20.31*	*20.31*	
RSM 314116101600 Sheet piling, steel, 27 psf, 20' excavation, drive, extract and salvage, excludes wales	800.00	SF	7,074	2,817	6,360	0	0	16,251	16,251	N
(Note: The area for temporary sheet piling was calculated by multiplying the height of the temporary bulkhead wall by the width of the lock chamber.)										
			0.00	*0.00*	*0.00*	*110,231.00*		*110,231.00*	*110,231.00*	
30 Planning, Engineering and Design	**1.00**	**EA**	**0**	**0**	**0**	**110,231**	**0**	**110,231**	**110,231**	
(Note: Costs based on 8% of Project Direct Cost per James J. Vermillion, CCC, Cost Engineer, USACE Louisville District.)										
USR USR Planning, Engineering, & Design	1.00	LS	0	0	0	110,231	0	110,231	110,231	Sb
(Note: Costs based on 8% of Project Direct Cost per James J. Vermillion, CCC, Cost Engineer, USACE Louisville District. Used 8% of $1,377,881 which corresponds to the total project direct costs for all items except for Planning, Engineering, & Design.)										

Currency in US dollars

Description	Quantity	UOM	DirectLabor	DirectEQ	DirectMatl	DirectSubBid	DirectUserCost	DirectShip	DirectCost	C/O
Job Office Overhead Direct Cost Report										
Prime										
Sub										
			185,403.45	*67,761.79*	*30,584.18*	*22,530.00*		*0.00*	*306,279.42*	
Overhead	**1.00**	**EA**	**185,403**	**67,762**	**30,584**	**22,530**	**0**	**0**	**306,279**	
			0.00	*0.00*	*0.00*	*0.00*		*0.00*	*0.00*	
USR ST Small Tools	1.00	EA	0	0	0	0	0	0	0	
			0.00	*0.00*	*0.00*	*0.00*		*0.00*	*0.00*	
USR ST Small Tools	1.00	EA	0	0	0	0	0	0	0	
			1,209.81	*0.00*	*8,557.38*	*708.00*		*0.00*	*10,475.19*	
Job Office	**1.00**	**EA**	**1,210**	**0**	**8,557**	**708**	**0**	**0**	**10,475**	
			0.00	*0.00*	*801.36*	*88.50*		*0.00*	*889.86*	
USR USR Job Office Expenses	8.00	MO	0	0	6,411	708	0	0	7,119	
			1,209.81	*0.00*	*2,146.50*	*0.00*		*0.00*	*3,356.31*	
RSM 015113500060 Temporary electrical power equipment (pro-rated per job), overhead feed, 3 uses, 600 amp	1.00	EA	1,210	0	2,147	0	0	0	3,356	
			104,294.00	*14,971.23*	*0.00*	*21,304.00*		*0.00*	*140,569.23*	
Civil Superintendent	**1.00**	**EA**	**104,294**	**14,971**	**0**	**21,304**	**0**	**0**	**140,569**	
			13,036.75	*1,871.40*	*0.00*	*2,663.00*		*0.00*	*17,571.15*	
USR USR_013113200310 Civil superintendent	8.00	MO	104,294	14,971	0	21,304	0	0	140,569	
(Note: Assume civil superintendent works from May 2015-December 2015 for a total of 8 months. SubBid Cost consists of per diem/month for site superintendent. Per diem rate obtained from GSA FY 2011 Per Diem Rates for Kentucky - http://www.gsa.gov/portal/category/100120 $77/day for lodging + $46/day for meals and incidental expenses = $123/day per diem. $123/day per diem x 5 days/week x 4.33 weeks/month = $2663 per diem/month. Equipment cost consists of 4x4 truck for superintendent's use.)										
			0.00	*0.00*	*0.00*	*518.00*		*0.00*	*518.00*	
Laboratory Testing	**1.00**	**EA**	**0**	**0**	**0**	**518**	**0**	**0**	**518**	
			0.00	*0.00*	*0.00*	*259.00*		*0.00*	*259.00*	
RSM 014523502600 Concrete testing, mix design, one batch mix	2.00	EA	0	0	0	518	0	0	518	
			1,365.77	*90.22*	*1,696.00*	*0.00*		*0.00*	*3,151.99*	
Maintain Access and Parking Areas	**1.00**	**EA**	**1,366**	**90**	**1,696**	**0**	**0**	**0**	**3,152**	
			3.41	*0.23*	*4.24*	*0.00*		*0.00*	*7.88*	
RSM 015523500050 Temporary, roads, gravel fill, 4" gravel depth, excl surfacing	400.00	SY	1,366	90	1,696	0	0	0	3,152	
(Note: Provides one parking area south of East Abutment Cell and a second parking area north of the concrete esplanade at the lock.)										
			132.85	*0.00*	*20,330.80*	*0.00*		*0.00*	*20,463.65*	

Currency in US dollars

Description	Quantity	UOM	DirectLabor	DirectEQ	DirectMatl	DirectSubBid	DirectUserCost	DirectShip	DirectCost	C/O
Sediment Control	**1.00**	**EA**	**133**	**0**	**20,331**	**0**	**0**	**0**	**20,464**	
			0.66	*0.00*	*0.42*	*0.00*		*0.00*	*1.09*	
RSM 312513101100 Synthetic erosion control, silt fence, polypropylene, adverse conditions, 3' high	200.00	LF	133	0	85	0	0	0	218	
			0.00	*0.00*	*10,123.00*	*0.00*		*0.00*	*10,123.00*	
USR USR Silt Curtain	2.00	EA	0	0	20,246	0	0	0	20,246	
(Note: Costs from KY LD3 Estimate Alan Rauch: Call to Elastec/American Marine on 14Jan08 (rep = Duane Bennish 800-871-4156 ext 17) For 200 ft by 25 deep, for heavy flow conditions - Panels: 2 @ $3210 each - Anchors 8 @ $300 each - Toe Bridles 4 @ $77 each. 2008 cost per curtain is $9500. Multiply $9500 x 0.52% to escalate from 2008 to 2010.)										
			0.00	*8,683.31*	*0.00*	*0.00*		*0.00*	*8,683.31*	
4x4 Trucks	**1.00**	**EA**	**0**	**8,683**	**0**	**0**	**0**	**0**	**8,683**	
			0.00	*10.85*	*0.00*	*0.00*		*0.00*	*10.85*	
GEN T50Z7320 TRUCK, HIGHWAY, CONVENTIONAL, 8,800 LB (3,992 KG) GVW, 4X4, 2 AXLE, 3/4 TON (0.68 MT) - PICKUP	800.00	HR	0	8,683	0	0	0	0	8,683	
			1,803.21	*572.44*	*0.00*	*0.00*		*0.00*	*2,375.64*	
Clearing and Grubbing	**1.00**	**EA**	**1,803**	**572**	**0**	**0**	**0**	**0**	**2,376**	
			9,016.03	*2,862.18*	*0.00*	*0.00*		*0.00*	*11,878.21*	
RSM 311110100300 Clearing & grubbing, heavy trees, to 24" diameter, cut and chip	0.20	ACR	1,803	572	0	0	0	0	2,376	
			76,597.82	*43,444.59*	*0.00*	*0.00*		*0.00*	*120,042.41*	
Equipment Mobilization	**1.00**	**EA**	**76,598**	**43,445**	**0**	**0**	**0**	**0**	**120,042**	
			70,115.38	*39,363.39*	*0.00*	*0.00*		*0.00*	*109,478.77*	
Barge Mobilization	**1.00**	**EA**	**70,115**	**39,363**	**0**	**0**	**0**	**0**	**109,479**	
RSM 352023130100 Mechanical dredging, mobilization and demobilization, add to below, maximum	2.00	LS	70,115	39,363	0	0	0	0	109,479	
(Note: Assume two mobilization and demobilizations to cover the two barges (1 work barge and 1 material transport barge).)										
			162.01	*194.72*	*0.00*	*0.00*		*0.00*	*356.74*	
Backhoe Mobilization	**1.00**	**EA**	**162**	**195**	**0**	**0**	**0**	**0**	**357**	
			81.01	*97.36*	*0.00*	*0.00*		*0.00*	*178.37*	
RSM 015436500020 Mobilization or demobilization, dozer, loader, backhoe or excavator, 70 H.P. to 150 H.P., up to 50 miles	2.00	EA	162	195	0	0	0	0	357	
(Note: Quantity is 2 to cover 1 mobilization and 1 demobilization.)										
			162.01	*194.72*	*0.00*	*0.00*		*0.00*	*356.74*	
Front End Loader Mobilization	**1.00**	**EA**	**162**	**195**	**0**	**0**	**0**	**0**	**357**	
			81.01	*97.36*	*0.00*	*0.00*		*0.00*	*178.37*	
RSM 015436500020 Mobilization or demobilization, dozer, loader, backhoe or excavator, 70 H.P. to 150 H.P., up to 50 miles	2.00	EA	162	195	0	0	0	0	357	

Currency in US dollars

Description	Quantity	UOM	DirectLabor	DirectEQ	DirectMatl	DirectSubBid	DirectUserCost	DirectShip	DirectCost	C/O
(Note: Quantity is 2 to cover 1 mobilization and 1 demobilization.)										
			6,158.42	*3,691.75*	*0.00*	*0.00*		*0.00*	*9,850.17*	
Crane Mobilization	**1.00**	**EA**	**6,158**	**3,692**	**0**	**0**	**0**	**0**	**9,850**	
			4,316.65	*2,859.70*	*0.00*	*0.00*		*0.00*	*7,176.35*	
Assembly Crew for Cranes	**1.00**	**EA**	**4,317**	**2,860**	**0**	**0**	**0**	**0**	**7,176**	
(Note: Assume 1, 10-hour day per crane per mobilization or demobilization for a total of 40 hours for the assembly crew (2 cranes x 2 mob/demob trips/crane x 10 hours/mob/demob trip).)										
			107.92	*71.49*	*0.00*	*0.00*		*0.00*	*179.41*	
RSM A3G A3G	40.00	HR	4,317	2,860	0	0	0	0	7,176	
			1,151.11	*762.59*	*0.00*	*0.00*		*0.00*	*1,913.69*	
150-ton Crawler Crane Mobilization	**1.00**	**EA**	**1,151**	**763**	**0**	**0**	**0**	**0**	**1,914**	
			575.55	*381.29*	*0.00*	*0.00*		*0.00*	*956.85*	
RSM 015436502300 Mobilization or demobilization, crane, crawler-mounted, over 75 ton	2.00	EA	1,151	763	0	0	0	0	1,914	
(Note: Quantity is 2 to cover 1 mobilization and 1 demobilization.)										
			690.66	*69.47*	*0.00*	*0.00*		*0.00*	*760.13*	
100-ton Wheeled Crane Mobilization	**1.00**	**EA**	**691**	**69**	**0**	**0**	**0**	**0**	**760**	
			345.33	*34.73*	*0.00*	*0.00*		*0.00*	*380.07*	
RSM 015436502100 Mobilization or demobilization, crane, truck-mounted, over 75 ton	2.00	EA	691	69	0	0	0	0	760	
(Note: Quantity is 2 to cover 1 mobilization and 1 demobilization.)										

Currency in US dollars